REMARKS:

This paper is herewith filed in response to the Examiner's Office Action mailed on April 1, 2009 for the above-captioned U.S. Patent Application. This office action is a rejection of claims 1-3, 6-21, 24-39, and 42-46 of the application.

More specifically, the Examiner has rejected claims 19-21, 24-36, and 43-46 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention; rejected claims 19-21, 24-36, and 43-46 under 35 USC 112, first paragraph, as failing to comply with the written description requirement; rejected claims 19-21 and 24-46 under 35 USC 101 because the claimed invention is drawn to non-statutory subject matter; rejected claims 1-3, 6-7, 9-17, 19-21, 24-25, 27-35, 37-39, and 42 under 35 USC 103(a) as being unpatentable over Friedman (US6,182,029) in view of Brecher (US7,054,754) and in view of Moore (US5,577,239) in view of Dittmar (J. Chem. Inf. Comput. Sci. Vol. 23, No. 3), in view of Hull (US6,332,138) and in view of Leiter (J. Chem. Doc., Vol. 15, 1965); rejected claims 8 and 26 under 35 USC 103(a) as being unpatentable over Friedman in view of Brecher, in view of Moore, in view of Dittmar, in view of Hull (US6,332,138), and in view of Leiter, and further in view of Drefahl (J. Chem. Inf. Comput. Sci., Vol. 33) and Murray-Rust (New Chem. Vol. 25, p 618-634, 2001); rejected claims 18 and 36 under 35 USC 103(a) as being unpatentable over Friedman in view of Brecher in view of Moore in view of Dittmar, in view of Hull, in view of Leiter, and further in view of Kemp (Chem. Inf. Comput. Sci., Vol. 38); rejected claims 43-44 under 35 USC 103(a) as being unpatentable over Friedman in view of Brecher and in view of Moore in view of Dittmar in view of Hull in view of Leiter, and in view of Shivaratri (Computer December 1992); and rejected claims 45-46 under 35 USC 103(a) as being unpatentable over Friedman in view of Brecher and in view of Moore in view of Dittmar in view of Hull in view of Leiter in view of Shivaratri in view of Drefahl and Murray-Rust. The Applicants traverse the rejections.

Claims 1-3, 7-20, 25-27, 28-36, and 42-46 have been amended for clarification. Support for the amendments can be found at least in paragraphs [0039], [0048], [0053], [0074]-[0078], [0081]-[0084], [0089], and [0091], as well as in original claim 37 of the published application. Claims 6,

21, 24, and 37-39 have been cancelled. No new matter is added.

Regarding the rejections of claims 19-21, 24-36, and 43-46 under 35 USC 112, first paragraph, and under 35 USC 112, second paragraph, the Applicants disagree with the rejections. However, the Applicants note that claims 19-20, 25-26, 28-36, and 43-46 have been amended to relate to a system having at least one computer including modules which are configured to perform operations in accordance with the exemplary embodiments of the invention.

The Applicants note that, during the interview on June 23, 2009, these amendments were similarly suggested by the Examiner. In addition, the Applicants note that, in the interview, the Examiner indicated that these amendments would overcome the rejections under 35 USC 112, first paragraph, and the rejections under 35 USC 112, second paragraph. Support for these amendments can be found at least in paragraphs [0089] and [0091] of the published application.

The Applicants submit that, for at least these reasons, the rejections of claims 19-21, 24-36, and 43-46 under 35 USC 112, first paragraph, and under 35 USC 112, second paragraph, are seen to be overcome and the rejections should be removed.

Additionally, the Applicants assert that the Office Action's reliance on 35 USC 112, sixth paragraph, is misplaced. No claim element carries the required language set forth in the three prong analysis stipulated at MPEP 2181 part I, and therefore do not invoke 35 USC 112, sixth paragraph. It is well established that apparatus may be defined and claimed using functional language without falling subject to 35 USC 112, sixth paragraph.

In regards to the rejection of claims 19-21 and 24-46 under 35 USC 101 the Applicants note that claims 21, 24, and 37-39 are cancelled and claims 19-20 and 25-36 have been amended to recite hardware including modules which are configured to perform operations in accordance with the exemplary embodiments of the invention. Further, as stated above, claims 43-46 have been similarly amended to specifically recite hardware.

The Applicants submit that these amendments to claims 19-20, 25-36, and 43-46, as stated above, address the statutory requirements as indicated by the Examiner in the rejections. If the Examiner feels that this is not the case the Applicants respectfully request that the Examiner contact the undersigned representative to address this matter.

Thus, the rejection of these claims under 35 USC 101 is seen to be overcome and the rejection should be removed.

Regarding the proposed claim amendments faxed to the Examiner, the Applicants thank the Examiner for his telephone call to the Applicant's Representative, on June 26, 2009, where the Examiner indicated that amendments proposed in this Response distinguish the claims over the references cited. The Applicants are hopeful that after a further search, which the Examiner indicated he will perform, claims in the pending application will be found to be allowable by the Examiner.

The Applicants note that during the above mentioned telephone call the Examiner indicated that the following similar claim elements were seen to be novel over the references cited:

Where elements of amended claim 1 relate to:

- adding each of the recognized chemical name fragments and the substructures that do not contain a number to the text index,
- determining structural connectivity information of each of the recognized chemical name fragments and the substructures that do not contain a number, and
- where the search comprises first entering search terms comprising one or more chemical fragment names and then selecting graphical representations of one or more substructures.

Where elements of amended claim 8 relate to:

- testing if each of the recognized chemical name fragments occur in a SMILES fragment

dictionary, where if it does occur in the SMILES fragment dictionary then adding the chemical name fragment to the chemical substructure index as the SMILES representation, and

- testing if each of the recognized chemical name fragments occur in a MOL file fragment dictionary, where if it does occur in the MOL file dictionary then adding the chemical name fragments to the chemical substructure index as the MOL file representation.

Where elements of amended claim 16 relate to:

- where the characters comprise upper case C, O, R, N and H.

Where elements of amended claim 17 relate to:

- where the characters comprise lower case xy, ene, ine, yl, ane and oic.

In addition, the Applicants respectfully submit to the Examiner that the references cited are, similarly, not seen to disclose or suggest at least the following amended claim elements:

Where elements of amended claim 1 relate to:

- where the selecting comprises using the graphical user interface as a pointer to a graphical list of substructures; and receiving a search result, where the search result is an intersection of the chemical substructure index and the text index, identifying at least one document where there are found chemical compounds that contain a reference to the search terms and the one or more substructures, where the selecting comprises using the graphical user interface as a pointer to a graphical list of substructures.

Where elements of amended claim 2 relate to:

- first entering search terms comprising the one or more chemical fragment names and entering at least one keyword, and where the search result is identifying at least one document

where there are found the at least one keyword, the chemical compounds that contain the selected substructures, and the connectivity specified by the one or more chemical fragment names and the selected substructures.

Where elements of claim 9 relate to:

- where said plurality of dictionaries consists of a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments.

Where elements of claim 10 relate to:

- where said plurality of dictionaries consists of the common chemical prefix dictionary and the common chemical suffix dictionary, and a dictionary of stop words.

The Applicants respectfully request that, for at least these reasons, the Examiner reconsider and allow the pending claims.

With regards to the rejections under 35 USC 103(a) in the present Office Action, the Applicants note, as stated above, that these rejections appear identical to the rejections applied in the final Office Action dated July 25, 2008. The Applicants disagree with the rejections. Further, the Applicants resubmit the arguments in at least the Response filed September 10, 2008 and in the Pre-Appeal Request for Review filed November 25, 2008.

The Applicants note that claim 1 has been amended to recite:

> A method to process a text document, comprising: partition text of the text document and assigning semantic meaning to words of the partitioned text, where assigning comprises applying a plurality of regular expressions, rules and dictionaries comprising a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments; recognizing any substructures present in the chemical name fragments; extracting keywords associated with the recognized chemical name fragments and the substructures of

> the text document and indexing the extracted keywords in a text index; adding each of the recognized chemical name fragments and the substructures that do not contain a number to the text index; determining structural connectivity information of each of the recognized chemical name fragments and the substructures that do not contain a number; indexing representations of the recognized chemical name fragments and the substructures in association with the determined structural connectivity information into a plurality of chemical connectivity tables of a chemical substructure index; storing the text index in association with the chemical substructure index; providing a graphical user interface to search the text index and the chemical substructure index, where the search comprises first entering search terms comprising one or more chemical fragment names and then selecting graphical representations of one or more substructures, where the selecting comprises using the graphical user interface as a pointer to a graphical list of substructures; and receiving a search result, where the search result is an intersection of the chemical substructure index and the text index, identifying at least one document where there are found chemical compounds that contain a reference to the search terms and the one or more substructures.

The Applicants submit that the references cited do not disclose or suggest claim 1.

In the Response to Arguments section of the Office Action the Examiner states:

> "As indicated in the rejection, Friedman does not explicitly recite the recognition of chemical names from text. Rather, Friedman et al, as identified in the rejection and reiterated by applicant, suggest the chemical names can be documented or "tagged" using Chemical Markup Language (CML) (col. 11, line 46-48). Thus, while Friedman et al. **does not explicitly show the recognition of chemical names**. Friedman does show the semantic parsing or "partitioning" of documents using a lexicon **to "tag" recognized words or terms using XML**," and
>
> "Brecher et al. shows the recognition of chemical names. Applicant argues that neither Brecher et al. nor Friedman et al. shows partitioning text documents. The argument is not persuasive. **Brecher et al. shows the file based inputs, reading on text documents** (col. 2, line 49). Brecher et al. shows that regular expressions are applied to parse or "partition" the text (col. 5, line 40-50). **Brecher et al. shows the names are looked up in a chemical lexicon** (col. 6, line 30-40)," (emphasis added).

The Applicants respectfully disagree.

The rejection of claim 1 applies Brecher and Friedman to disclose or suggest where claim 1 recites in part:

> "partition text of the text document and assigning semantic meaning to words of the partitioned text, where assigning comprises applying a plurality of regular expressions, rules and dictionaries comprising a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments; recognizing any substructures present in the chemical name fragments"

Firstly, the Applicants respectfully resubmit that the Examiner is in error where the Examiner appears to assert that Friedman relates to **recognizing chemical name fragments** as in claim 1.

As cited Friedman discloses:

> "Widespread adoption of markup languages are evidenced by: the Text Encoding Initiative (TEI) which uses SGML to encode literature; Chemical Markup Language (CML), which involves documentation of chemical compounds using SGML; and Open Financial Exchange (OFE), which is an SGML standard format for interchange of financial transactions," (emphasis added), (col. 11, lines 44-50).

The Applicants note that, as cited, Friedman makes note that a "Widespread adoption of markup languages are evidenced by:" and then goes on to list several types of markup language including Chemical Markup Language (CML), which involves documentation of **chemical compounds** using SGML. The Applicants submit that this statement in Friedman is only made as an example of the widespread **adoption of markup languages**. Further, the Applicants submit that the adoption of markup languages, as cited in Friedman, relates to markup language for "chemical compounds" and does not read on markup language for chemical name **fragments**. The Applicants contend that in all of Friedman there can not be found any disclosure or suggestion of partitioning text **to recognize chemical name fragments**, as in claim 1.

It is noted that in the Response to Arguments section of the Office Action, as stated above, the Examiner states that "Friedman does show the semantic parsing or "partitioning" of documents using a lexicon to "tag" recognized words or terms using XML," and that "Brecher et al. shows

the file based inputs, reading on text documents (col. 2, line 49)."

The Applicants note that, as cited, Brecher merely discloses **a chemical name** is supplied via a keyboard, **file-base input**, or a query input (col. 2, lines 46-49). Brecher does not disclose **partitioning** text of the text document or **recognizing** chemical name fragments.

With regards to the Applicants argument that the proposed combination of Brecher and Dittmar is improper at least for the reason that the Examiner is asserting a feature of searching upper case characters in Dittmar which appears to conflict with a name being converted to all lower-case characters as in Brecher, the Examiner states in the Response to Arguments section that:

> "As applicant points out, Brecher et al. does show that chemical names are first converted to lower case. However Brecher et al. shows atomic chains are in upper case (col. 10, line 1-19). Dittmar et al. also shows that atomic chains are in upper case. Furthermore, the claims do not require that all steps be performed with uppercase letters. The claims only requires that the characters of the regular expression comprise the uppercase at least one of C, O, N, R, and H. Brecher et al. shows the regular expressions scan the buffer for uppercase O, N and R (col. 4-5)."

The Applicants submit that, here, the Examiner is citing where Brecher appears to disclose a description with respect to the example of "Penta," as found in an associated data object of the lexicon in Brecher Col. 9, line 57 to col. 10, line 5). The Applicant contends that the Examiner showing a capital letter string of 5 carbon atoms in a lexicon of Brecher can not be seen to address the argument asserted by the Applicants relating to a conflict between Brecher and Dittmar that is caused by a name being converted to all lower-case characters as in Brecher. Thus, the Applicants submit that Examiner is not seen to have addressed the Applicants arguments.

Further, apparently with regards to the Applicants argument against the Examiner's assertion in the rejection that Hull is extracting keywords, the Examiner states in the Response to Arguments section of the Office Action that:

> "Applicant argues that Hull et al. does not show extracting keywords. The argument is not found persuasive. Hull et al. describes generating a database of keywords or descriptors (col. 9, line 15-30). Hull et al. further shows that the descriptors or keywords can be chemical name fragments as textual representations of chemical descriptors (col. 9, line 23-25). Hull shows the database can be searched by a text word and a structure (col. 10, line 54-57). Applicant argues that Moore et al. does not show a search query of a chemical name and a chemical structure. The argument is not persuasive. Moore et al. shows chemical names or name fragments and chemical substructures can be searched (col. 2, line 43-54). One would have been motivated by Hull et al. to combine text and structure searching because Hull et al. shows that the combined text structure search advantageously improves the search by "tweaking" (col. 16, line 25-27)."

The Applicants disagree with the Examiner.

As cited Hull discloses:

> "**Generating a TIMI database includes** the following sequential, non-sequential, or sequence independent steps. Referring to FIG. 3, in step S300, **a user and/or a computer generates or creates chemical and textual descriptors for each compound represented in the database**. The textual descriptors may, for example, originate from a collection of documents, or other text source, in, say, ASCII format or other suitable format. A textual representation of the chemical descriptors is also added to the textual descriptors," (col. 9, lines 15-25), (emphasis added).

The Applicants contend that Hull can not be seen to be **extracting keywords** as indicated in the rejection. Rather, as cited by the Examiner, Hull discloses a method for generating a TIMI database by **generating descriptors for each compound represented in a database**. Further, the Applicants submit that the Examiner's application of Hull in the rejection is unclear.

It is noted that in the prior Response the Applicants pointed out that Hull performs a search adapted for specifically structured proprietary databases (i.e. TIMI databases). Hull discloses that the TIMI databases are generated according to specific procedures (see col. 9, line 15 to col. 10, line 52). It is also pointed out that the Examiner has not addressed the Applicants argument that

one skilled in the art would not be motivated to combine the references for at least the reason that the references cited rely on different search methodologies based on disparate proprietary database systems.

In the Response to Arguments section of the Office Action the Examiner states:

> "Applicant argues that Friedman et al. in view of Brecher et al. in view of Moore in view of Hull et al. in view of Dittmar et al. and in view of Leiter does not show selecting a graphical representation. The argument is not persuasive. Hull et al. shows that chemical structures are searched (col. 12, line 64-67; col. 13, line 17-19). Hull et al. shows the query structure is translated in connection table (col. 10, line 55-61). Moore et al. shows the entry of a structure to be queried (col. 8, line 16-21). Moore et al. shows entry of chemical structures by selection (col. 4, line 28-35). Both Moore et al. and Hull teach the translation of a graphical representation to a connection table. With respect that applicant's argument that Friedman et al. in view of Brecher et al. in view of Moore in view of Hull et al. in view of Dittmar et al. and in view of Leiter does not show claim 3. The argument is not persuasive. Moore et al. shows that connection tables are representations of chemical structure (col. 4, line 37-52). As addressed above, Moore shows that system automatically generates a connection table from the substructure entered by the user (col. 7, line 49-56; col. 4, line 28-35). The rejection is maintained."

The Applicants disagree with the Examiner.

The Applicants note that the Examiner has not addressed the Applicants' argument that one skilled in the art would not be motivated to combine a user interface for searching the proprietary database of Dittmar in order to search other than CAS systems. The CAS online system of Dittmar provides a user interface for online searching of **specifically designed CAS screens** that are stored and filed in a CAS database (see abstract). Further, Dittmar discloses that a search query is defined in terms of structure diagrams and Boolean operators (page 95, 2nd paragraph). The Applicants submit that the **CAS online system** of Dittmar cannot be used as a graphical user interface to search **a text index and a chemical substructure index**, where the search comprises first entering search terms comprising one or more chemical fragment names and then selecting graphical representations of one or more substructures, where the selecting comprises using the graphical user interface as a pointer to a graphical list of substructures, as in claim 1.

Further, the Examiner has not addressed the Applicants argument that a modification of the reference using the CAS online system of Dittmar would change the principle operation of the reference. In accordance with MPEP 2143.01, such a combination is improper for an obviousness rejection. The Applicants submitted that for at least these reasons an ordinary person skilled in the art would not be motivated to combine Dittmar with the other references cited in the rejection of claim 1.

Moreover, the Applicants contend that none of the references cited can be to disclose or suggest at least where amended claim 1 recites in part:

> "providing a graphical user interface to search the text index and the chemical substructure index, where the search comprises first entering search terms comprising one or more chemical fragment names and then selecting graphical representations of one or more substructures"

The Applicants submit that in all of references cited there can not be found any suggestion or disclosure relating to at least where claim 1 relates to first entering search terms comprising one or more chemical fragment names and then selecting graphical representations of one or more substructures.

For at least these reasons the Applicants contend that the references cited, alone or combined, can not be seen to disclose or suggest claim 1. Thus, the Applicants respectfully request that the Examiner remove the rejection of claim 1 and allow claim 1 to issue.

Further, as the independent claim 19 distinguishes over the references for reasons similar to those detailed for claim 1 as stated above, the references are not seen to disclose or suggest all of claims 1 and 19. Thus, the rejections of these claims should be removed.

Regarding independent claim 43, the Applicants submit that for at least the reason that claim 43 recites features similar to claim 1, as stated above, claim 43 is also distinguishable over the

references for at least the reasons already stated.

In addition, the Applicants submit that claim 43 is further distinguishable from the references cited for at least the reason that claim 43 recites in part:

> "a tokenizer and a token processing unit configured to parse text of a text document and assign semantic meaning to words of the parsed sentences, where assigning comprises applying a plurality of regular expressions, rules and dictionaries consisting of a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments"

The Applicants note that the description explicitly discloses that "By way of introduction, this invention uses a series of regular expressions, rules, and two small dictionaries to recognize chemical name fragments," (emphasis added), (par. [0039]). In addition, it is noted that the specification discloses operations in accordance with the exemplary embodiments of the invention that relate to parsing sentences in a technical document to recognize chemical terms "that previously could only be resolved by reference to a multi-million word chemical dictionary," (emphasis added), (par. [0048]).

The Applicants note that Friedman discloses that a lexicon knowledge base 101 is used by the MedLee system to identify and categorize multi-word and single word phases within each sentence (col. 7, lines 14-19). The Applicants submit that the lexicon knowledge base in the MedLEE system of Friedman can be seen to disclose or suggest dictionaries consisting of a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments, as in claim 43.

Rather, the Applicants contend that the lexicon knowledge base of Friedman is seen to relate to multi-million word chemical dictionary which the pending application is seen to teach away from, as similarly stated above.

In addition, the Applicants submit that Brecher apparently also relies on a large lexicon in which each known text string in Brecher is associated with terms in the lexicon (see Brecher col. 6, lines

35-45).

Brecher discloses:

> "a fragment is determined to be meaningful ("recognized") if an exact match for the fragment is found in a dictionary of known text strings ("lexicon") that is maintained by the system," and
>
> "Each known text string is associated in the lexicon with at least one data object known as a nomToken (FIG. 6). A nomToken includes the text of the known text string as its name and is described by Type and Subtype data members, which allow similar fragments to be grouped in accordance with two levels of similarity," (emphasis added), (col. 6, lines 36-45).

The Applicants submit that it can be seen that here Brecher disclose a single dictionary with which includes associated data objects known as nomTokens. Further, the Applicants note that there are numerous nomToken types disclosed in Brecher. The Applicants contend that, clearly, the operations of Brecher relating to grouping fragments in accordance with Type and Subtype data member of these nomTokens of the lexicon of Brecher can not be seen to disclose or suggest dictionaries consisting of a common chemical prefix dictionary and a common chemical suffix dictionary to recognize chemical name fragments, as in claim 43.

The Applicants contend that none of the other references cited can be seen to address the above stated short falls of Friedman and Brecher. The Applicants contend that for at least these reasons the rejection of claim 43 should be removed.

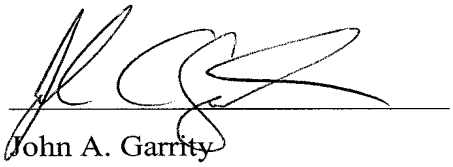
Further, the Applicants submit that although not all the rejections have been addressed in this Response, the Applicants do not acquiesce to the rejections.

In addition, for at least the reason that claims 2 and 7-18; claims 20, 25-26, and 28-36; and claims 42 and 44-46 depend from independent claims 1, 19, and 43, respectively, the references cited are not seen to disclose or suggest all these claims and the rejection of all these claims should be removed.

Based on the above explanations and arguments, it is clear that the references cited cannot be seen to disclose or suggest claims 1-2, 7-20, 25-26, 28-36, and 42-46. The Examiner is respectfully requested to reconsider and remove the rejections of all claims and to allow all of the pending claims 1-2, 7-20, 25-26, 28-36, and 42-46.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record. Should any unresolved issue remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Respectfully submitted:



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